

## **On The Move to Better Health**

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### **Program of Distinction Category**

#### **Healthy Lifestyles**

- Youth Obesity
- Nutrition Education
- Health & Fitness

#### **Science, Engineering and Technology Literacy**

- Food & Nutrition

#### **Youth in Governance**

- Youth Decision – Making

### **Sources of funding that support this program**

Several grants have been received to support the program. Funding entities have included the North Dakota Department of Health 5 Plus 5 program; North Dakota Nutrition Council; local Parent Teacher Organizations chapters, Fargo Cass Public Health Maternal and Child Health program; Nickelodeon, Inc. national "Let's Just Play" program (Sioux County); participating public schools; Cass County Extension Service, and NDSU Extension Service.

### **Knowledge and Research Base**

Childhood obesity is an issue of concern in the United States. Since the 1970s, the rate of childhood obesity has doubled among preschoolers and adolescents and has tripled among children ages 6-11 (Ogden, Flegal, Carroll, & Johnson, 2002). Increasing numbers of overweight children are being diagnosed with type 2 diabetes (Ludwig & Ebbeling, 2001). Overweight children as young as ages 3 or 4 are showing signs of high blood pressure and high cholesterol, and researchers are concerned that cases of cardiovascular disease among teenagers will increase (Freedman, Dietz, Srinivasan, & Berenson, 1999). About seven of 10

overweight adolescents will become overweight or obese adults. Obesity that persists into adulthood is linked with chronic diseases, including diabetes, heart disease, and certain types of cancer (Centers for Disease Control and Prevention [CDC], 2006).

Inactivity and poor food choices are among the modifiable issues associated with obesity. Children are not meeting national physical activity and nutrition goals (Physical Activity and Health: A Report of the Surgeon General, 1996). For example, children are increasingly choosing soda instead of milk and other nutritious beverages. A threefold increase in soda consumption, with a corresponding reduction in milk and fruit juice, has been observed as children move from elementary school to junior high school (Lytle, Seifert, Greenstein, & McGovern, 2000). Research has shown that for every 1-ounce decline in milk consumption, soft drink consumption increases 4.2 ounces, with a net gain of 31 calories and net loss of 34 milligrams of calcium (Yen & Lin, 2002). Researchers have reported the body has more difficulty compensating for carbohydrate calories in liquid form than solid form, which can increase calorie (energy) consumption beyond calorie need (Mattes, 1996).

In a comprehensive report, the Institute of Medicine (2004) provided goals for preventing obesity and promoting healthy weight in children, outlining roles for the food industry, schools, parents, communities, and the healthcare sector. According to the Child Nutrition and WIC Reauthorization Act of 2004, schools must have a wellness policy in place in 2006. Schools can play multiple roles in obesity prevention (Story, Kaphingst, & French, 2006). In response to the obesity issue, many schools are changing the school food environment to offer more fruits and vegetables in cafeterias and more nutritious choices in vending machines (Story, et al., 2006). Schools also play a major role in promoting lifelong physical activity among children (CDC, 1997). Other researchers are examining the role of the built environment in relation to the obesity epidemic. The built environment includes the availability of sidewalks and bike paths that children can use to walk or bike to and from school, which may help them meet current physical activity goals (Sallis & Glanz, 2006).

One of the most immediate consequences perceived by obese children is social discrimination (CDC, 2006). In addition, children can be "overweight" yet "undernourished." Even moderate undernutrition has lasting effects on cognitive development and school performance (Center on Hunger, 1995). Reaching elementary-age children and their families with positive, hands-on nutrition and physical activity messages can help promote healthy lifestyles during the teenage years and help prevent chronic disease throughout a lifetime.

## **Needs Assessment**

In addition to anecdotal input from school nurses and public health nutritionists regarding observations of food choices at school and overweight status, national and state data were used to determine the program objectives and to design the curriculum. North Dakota participates in the Youth Risk Behavior Survey (YRBS) developed by the Centers for Disease Control and Prevention (CDC). The survey measures progress toward national health objectives and leading health indicators related to dietary intake and physical activity, using validated questions and a defined sampling method (U.S. Department of Health and Human Services,

2004). In North Dakota, however, statewide public health data is not collected on children in elementary grades. North Dakota YRBS data, collected biannually on children in grades 7 to 12, are available by region but not available by county.

To assess needs for the target audience, therefore, the program coordinators used the results of the study of North Dakota sixth-grade students to help determine program goals (Freier & Egeland, 2004). In 2002, North Dakota public health nutritionists and nurses assessed body mass index (BMI) by measuring height and weight of 827 North Dakota sixth-grade students living in rural and urban areas. The "overweight" designation was based on a body mass index greater than or equal to the 95<sup>th</sup> percentile for age. Results showed that 19% of rural North Dakota students were overweight, compared with 12% of students living in urban areas. Overall, about 17% of sixth-grade students were overweight, and more boys (18%) were overweight than girls (14%) (Freier & Egeland, 2004).

The project also targeted Native American children living on a Reservation. Racial differences in weight are evident in the results of the CDC 2005 Youth Risk Behavior Survey (2005 YRBS Middle School). On a state level, among children in middle school in North Dakota (grades 7 and 8), 21% of Native American children are overweight or obese. The gap widens with age. Among children in high school (grades 9 through 12), the proportion of Native American children who are overweight or obese (24%) is more than twice that of White children (9%).

The On the Move to Better Health program, while targeting elementary students, also is designed to foster long-term healthy lifestyle choices regarding nutrition and physical activity among adolescents, with future assessment based on YRBS data. YRBS data were used to set curriculum goals and objectives. North Dakota youth are falling short of nutrition and physical activity recommendations, and progress toward health goals declines with increasing age.

According to the 2005 YRBS statewide results of students in grades 7 to 8, 82% ate less than five servings of fruits and vegetables per day during the past seven days, 59% drank less than three glasses of milk per day during the past seven days, 44% drank 13 or more ounces of sweetened beverages per day during the past seven days, 31% reported watching three or more hours of television on an average school day, and 72% participated in insufficient moderate physical activity (2005 YRBS Middle School). According to the 2005 YRBS statewide results of students in grades 9 to 12, 86% ate less than five servings of fruits and vegetables per day during the past seven days, 73% drank less than three glasses of milk per day during the past seven days, 47% drank 13 or more ounces of sweetened beverages per day during the past seven days, 24% reported watching three or more hours of TV on an average school day, and 74% participated in insufficient moderate physical activity (2005 YRBS High School).

## **Goals and Objectives**

The overall goal of On the Move to Better Health is to promote healthy lifestyle decisions regarding nutrition and physical activity among elementary-age youth in order to foster healthy lifestyle decisions during adolescence and adulthood. The objectives of the program are:

- 1) to increase knowledge/awareness of the health benefits of fruits and vegetables

- 2) to promote eating at least five servings of fruits and vegetables each day
- 3) to increase knowledge/awareness of the importance of selecting healthy snacks and beverages
- 4) to promote healthy snack and beverage choices at school and home
- 5) to increase knowledge/awareness of the health benefits of physical activity
- 6) to promote ways to be physically active at least five times a week for at least 30 minutes.

Short-term Expected Outcomes:

- Participating children will increase by 10% their knowledge of the health benefits and recommendations for fruits, vegetables, calcium-rich foods/beverages, and physical activity.
- Participating parents will increase by 10% their knowledge of the health benefits and recommendations for fruits, vegetables, calcium-rich foods, and physical activity.

Intermediate Expected Outcomes:

- Participating children will increase by 5% their average fruit and vegetable consumption.
- Participating children will decrease by 5% their average soda pop consumption.
- Participating children will increase by 5% their average physical activity level.
- Participating children and parents will set and achieve together 5% of healthy lifestyle goals, including reduced screen time and increased physical activity.

Long-term Expected Outcomes:

- Children will adopt healthy lifestyles to include regular physical activity and a varied diet to reduce risk of obesity and chronic diseases as measured by future YRBS data.

## **Target Audience**

The target audience for the On the Move to Better Health program included students in grades 4 to 6 enrolled in North Dakota public and private schools, along with their parents/caregivers in rural and urban settings. The locations included schools in a rural Reservation site (under 5,000 population), towns in rural settings (under 5,000 population), and a city (more than 50,000 population). Since the inception of the program in 2002, more than 2,200 children (49% male; 94% White, 2% Native American, 2% Hispanic, 1% Black, 1% Asian) in Cass County have participated. In Sioux County, a Reservation site in southwestern North Dakota, 115 children (51% male; 98% Native American, 2% White) participated in a 2005 pilot program.

## **Program Design and Content**

### ***Type of program***

On the Move to Better Health is a school-based program employing hands-on classroom education, supplementary learning activities, and take-home parent education newsletters. The program promotes a variety of healthy lifestyle behaviors among children in grades 4 to 6. Some of the activities from the curriculum also have been used in after-school enrichment programs and 4-H clubs.

### ***Methods used to deliver the program***

The 5-week program uses classroom instruction; skill-building hands-on activities; promotional activities in the cafeteria; posters on bulletin boards in classrooms and in libraries; and individual and family goal setting in homes. Each 45-minute weekly lesson has a theme: fruits/vegetables, snacks/beverages, or physical activity. Extension agents, public health nutritionists, and dietetics students teach the lessons with assistance from the classroom teacher. To extend classroom learning, the cafeteria provides healthy snacks based on the weekly theme for the participating students during the On the Move to Better Health lesson.

In an ongoing activity, children record their goals and activities in a journal. They measure progress toward their goals in a unique way: they “walk around” their county (or state) on a paper map showing a path of circles. To earn the reward of coloring in a circle, the student records the completed activity in his/her journal, an adult initials the activity, and the student colors in a circle on his/her map. The circles are color-coded to represent different health categories: fruit and vegetable consumption (green), physical activity (blue), beverage choices (red), and other healthy behaviors, such as brushing teeth (yellow). For every five circles earned, the student receives a different-colored bead to add to a string provided at the beginning of the program. The string of colorful beads can become a necklace, bracelet, or key chain.

To support and sustain healthy lifestyles learned in school, a parent component was added to the On the Move to Better Health program in the fall of 2003. The parent component consists of four educational newsletters with information on the weekly featured topic and ideas for family goals; a family goal sheet for the child to discuss with parents and bring back each week to share with the class; and a dry-erase board and marker for families to display on the home refrigerator and record at least one goal each week. To encourage the return of surveys, children who turn in goal sheets become eligible for prize drawings.

### ***Curricula and/or educational materials***

A review of available curricula from other states did not reveal a nutrition and physical activity curriculum that met the identified needs and time limitations for health education in North Dakota classrooms. On the Move to Better Health is a peer-reviewed nutrition/physical activity curriculum written by an Extension agent, a public health nutritionist, and senior-level college students majoring in dietetics. The curriculum was peer-reviewed by two dietitians and a curriculum design specialist, and revised based on their comments and pilot-tested in one school. Following use in 100 classrooms, an Extension food and nutrition specialist edited and compiled the curriculum for statewide use. The curriculum consists of five lesson plans/teaching scripts, hands-on activities, bulletin board posters, student packets/handouts, and parent newsletters packaged in a binder with a CD containing all the elements. In 2004, an educational video featuring teenage participants in the North Dakota Governor’s School was developed and disseminated to augment the curriculum.

In 2005, a pilot study was conducted to determine whether the lessons and activities are culturally appropriate for Native American youth, a growing population in North Dakota. With grant funding, project coordinators implemented the lessons

in school classrooms on a Reservation site where nearly all the students in schools are eligible for free or reduced-price meals. A second set of newsletters was created to include culturally relevant recipes, artwork, and other information.

### ***Partnerships or collaborations***

In Cass County, the Extension agent worked in conjunction with a public health nutritionist and area dietetic and community health students to develop and deliver the program. In Sioux County, the Extension agent worked with classroom teachers to deliver the program to Native American students. Classroom teachers played an integral role in the implementation and evaluation of the program, including collecting data sheets, disseminating beads and other incentives, and providing feedback on the implementation of the curriculum. Partners and their roles in the project are summarized as follows:

- Fargo Cass Public Health: Coordinate and run the program, teach the classes, and assist with finding funds to run the program with the Cass County Extension Service.
- North Dakota State University, Concordia College: Provide dietetic and community health students who assist in implementing the educational program.
- Northern Cass Public School; Central Cass Public School, Kindred Public School, Fargo Public Schools, West Fargo Public School, Oak Grove Private School: Allow classroom time to conduct program, provide printing of needed student packets, snacks for the lessons, and supervision of students.
- Standing Rock Elementary School, Sioux County: Allow classroom time to conduct program, provide printing and snacks for the lessons.
- Cannon Ball Elementary School and Selfridge Elementary School, Sioux County: Allow classroom time to conduct program; provide print and food for taste testing

### ***Program Evaluation Process***

This program is based on social cognitive theory. Social cognitive theory examines the development of cognition through competencies and the symbolizing capability of humans (Bandura, 1989). For example, the school cafeteria provides an environment in which children can draw immediate conclusions about what items are appropriate to consume during lunch. According to this theory, nutrition and health education programs are most successful when they fit into the cultural and peer rules that ultimately dictate behavioral patterns in school children. To augment classroom instruction, the On the Move to Better Health program used the school cafeteria, which provided healthy snacks and displayed nutrition posters, and the home environment, where children set and implemented goals with their parent(s)/caregiver(s).

During the implementation of On the Move to Better Health, the two program coordinators meet face-to-face twice weekly prior to the implementation of the program and weekly during the 5-week series of lessons, with additional communication by e-mail and phone. In addition, teachers are provided with phone numbers and e-mail addresses in the event of schedule changes. To assess teacher satisfaction with the program and their observations of student outcomes, a teacher

survey was implemented. In the past 4 years, 99% of teachers expressed satisfaction and wanted the program in their classrooms again the following year.

To evaluate progress toward program objectives, the coordinators administer pre/post-tests to evaluate student knowledge and self-reported behavior among participating children. The results are used to improve the overall program content and delivery, as well as to determine program impacts. For example, the lessons have been modified based on student outcomes, as well as changes in national nutrition recommendations (e.g., the introduction of MyPyramid). The surveys were approved by the North Dakota State University Institutional Review Board. To measure the impact of the parent education/goal-setting component, participating children deliver a survey to their parents/caregivers. The parent survey evaluates parent knowledge and behavior related to the program objectives. To enhance the return rate of parent surveys, children who return the surveys become eligible for prize drawings. In addition, a 1-year follow-up survey was piloted at one school.

### ***Outcomes and Impacts***

Cass County: During the 2004-05 school year, analysis of the pre- and post-tests of 1,130 participating children showed increases in knowledge of nutrition and physical activity concepts and changes in self-reported behavior upon completion of the program. The students who identified "at least 5" as the recommended number of daily fruit and vegetable servings increased from 52% to 84%. Overall, students who consume the recommended number of daily fruits and vegetables (5) increased from 17% as reported on the pretest to 27% on the post-test. The number of children consuming three or more servings of milk per day increased from 78% to 83%, and the number of children consuming two or more servings of soda pop per day decreased from 28% to 20%. Children engaging in physical activity at least five days a week increased from 66% to 79%, and children watching more than two hours of television per day decreased from 39% to 24%.

In 2003, a parent survey was piloted with 67 families, with a 76% return rate for the surveys. Parents gained knowledge and reported improvements in their family's diet. On the post-survey, 78% of parents knew the recommended number of servings for fruits and vegetables for their child (5), compared with 69% on the pre-survey. About 94% of parents reported setting a goal for fruits/vegetables and dairy consumption. Of those setting goals, 65% recorded the goal on a dry erase board they received, and 59% reported meeting the family goal. On the post-survey, about 96% of families reported serving three or more servings of dairy a day, compared with 82% on the pre-survey. Overall, 53% reported they increased fruit and vegetable consumption during the month, 37% reported they increased dairy consumption, and 31% reported serving five or more servings of fruits and vegetables per day, compared with 26% on the pre-survey.

In September 2005, a 1-year follow-up post-test was piloted at a rural school with sixth-grade students who participated in the On the Move to Better Health program the previous year as fifth-grade students. To determine retained knowledge and current self-reported behavior, the project leaders administered the surveys at one school with 33 participants, with no additional lessons or review. The results are shown in Table 1. According to the 1-year follow-up survey, students showed knowledge and behavior improvements over time in the areas of fruit/vegetable consumption, physical activity, and soda pop consumption. TV

viewing, however, returned to approximately the original level and milk consumption dropped slightly. The sustained behaviors may be linked, at least in part, to the On the Move to Better Health program but likely indicate that teachers and/or parents continued to review and stress key health messages after the program ended, or that environmental changes have occurred at school or at home.

Table 1. Evaluation results (pre/post and follow-up) for elementary students (n=33) participating in an On the Move to Better Health program.

	Pretest (9/04) (%)	Post-test (10/04) (%)	One-year follow-up (9/05) (%)
Knew fruit and vegetable recommendation (5 to 9/day)	35	60	72
Reported fruit and vegetable consumption $\geq$ 5 servings/day	14	20	24
Reported milk consumption $\geq$ 3 servings	81	83	78
Reported pop consumption $\geq$ 2 servings/day	38	20	12
Reported 30 minutes of physical activity 5 or more days/week	70	86	90
Reported TV viewing $\leq$ 2 hours/day	59	94	61

Sioux County: Following the On the Move to Better Health program, knowledge scores, and self-reported behavior showed improvements, and the use of beads and maps to plot progress toward goals was a popular, effective and culturally relevant activity according to teacher comments to the extension agent teaching the lessons. On the post-test, 94% of 115 participating children correctly identified the recommendation for five or more serving of fruit/vegetables a day, compared with 43% on the pre-test. On the post-test, 97% of participants reported they consume three or more servings/day of dairy, compared with 80% on the pre-test. On the post-test, 79% reported they are physically active five or more days/week, compared with 71% on the pre-test. As a result of this intervention, 58% of participants reported they increased the amount of fruits and vegetables they eat, 60% drank less soda pop, 80% set at least one family goal with their parents, and 76% increased the amount of time they are physically active.

### ***Communication to stakeholders***

Program outcomes have been reported to the North Dakota State University Extension Service through the Extension Accomplishments Reporting System (EARS), quarterly reports with participating county commissioners, federal impact reports, newsletter articles, and grant reports to our sponsors. A project leader conversed with a U.S. Representative about the program. The program recently received a program excellence award from the state Extension Service and a nutrition education award from the North Dakota Nutrition Council. To enhance outreach and highlight the results of this program, two oral presentations and four



poster sessions have been presented at state nutrition, dietetics, and public health conferences in North Dakota.

### **Program Sustainability**

The program began as a small, unfunded pilot project based on the request from a local school nurse for a program to improve nutrition and physical activity practices based on her observation of health behavior among elementary-age children in a rural school. Since 2002, program coordinators have received several small grants from a variety of funding sources to support the more than 2,300 participants in the two counties described previously. Schools have contributed in-kind resources, including photocopies and food. As word of the program has spread across the state, requests have come from schools to implement the program.

The program has become part of the state Extension Service plan of work, and “train-the-trainer” sessions have been provided at a statewide conference for Extension agents. A “train-the-trainer” session with fourth-grade teachers is being planned. All North Dakota county Extension Service offices have copies of the curriculum, accompanying video, and a CD-ROM with materials that can be personalized with county-specific contact information. An on-line data entry tool for use by educators around the state will be piloted in 2006 to facilitate input and analysis of evaluation data related to this program. The survey evaluation tool will allow separation by county and site. Using the county extension service network of the land-grant system and enlisting partners from other agencies, this program has the potential to reach thousands of children in classrooms and other settings across North Dakota.

### **Replication**

In 2004, the On the Move to Better Health curriculum was edited, compiled, and distributed statewide to 52 counties and one Reservation site in North Dakota. The packaged curriculum includes the lesson plans, handouts, and evaluation tools. The program has been replicated in many counties in North Dakota without special funding. In 2006, 15 counties (of 53 North Dakota Extension Service locations) reported using the materials, and more than 4,300 youth have participated in healthy lifestyles education. As a school-based program, it is being used to provide educational support for local school wellness policies required to be in place by the 2006-07 school year. The materials easily could be adapted for use in other states.

### **Rationale and Importance of Program**

As shown by numerous studies, children are falling short of nutrition and physical activity goals, placing them at risk for becoming overweight or obese and developing chronic disease over time. This program meets national, state and local goals to improve lifestyle choices regarding nutrition and physical activity among children. The On the Move to Better Health program is based on credible research and identified needs. It is being replicated in counties across North Dakota. It has been shown to be effective in increasing fruit and vegetable intake, improving beverage choices, and increasing physical activity among children and their families.

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